

## REMARKS

In the Office Action, it is noted that previous claims 1 and 4 did not recite the acidic environment in which the antimicrobial compound inhibits the growth of *Staphylococcus aureus*. Previous claims 1 and 4 have now been amended to include this feature as described at page 7, lines 23-25 of the specification as filed.

Claim 1-4 were rejected under 35 USC §103(a) as being unpatentable over U.S. Patent No. 6,548,552 (US '552) in combination with U.S. Patent No. 6,313,178 (US '178) and U.S. Patent No. 6,706,276 (US '276). The Applicants have amended claims 1 and 4 to more clearly distinguish the claimed invention. Specifically, claims 1 and 4 have been amended to recite the acidic environment in which the antimicrobial compound inhibits the growth of *Staphylococcus aureus*. It is respectfully submitted that US '552 and US '178 and US '276 fail to teach the use of tetrahydroiso-alpha acids or hexahydro-beta acids at the recited concentration levels and acidic environment of the amended claims.

The Office Action acknowledges that US '552 does not teach the tetrahydroiso-alpha acids and hexahydro-beta acids used in the claimed invention. While US '178 teaches the use of such compounds to inhibit *Staphylococcus aureus*, it does not suggest effective concentrations for the claimed method and product, particularly in the acidic environment of the liquids (i.e., urine) in a diaper. It is further noted that the Applicant presented data on the activity of tetrahydroiso-alpha acids and hexahydro-beta acids in acidic environments in the Examples in the specification.

The Office Action states that it would have been obvious to optimize the amount of tetrahydroiso-alpha acids and hexahydro-beta acids. It is also noted that US '276

teaches the inhibition of organisms in the vagina which is acidic.

While the Applicant concedes that under certain circumstances discovering an optimum range of variable may involve only routine skill in the art (see, for example, *In Re Aller*, 105 USPQ 233), M.P.E.P. 2144.05 cites *In re Antonie* for the proposition that “a particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation.”

Specifically, the *Antonie* court stated that

In *In re Aller*, 220 F.2d 454, 42 CCPA 824, 105 USPQ 233 (1955), the court set out the rule that the discovery of an optimum value of a variable in a known process is normally obvious. We have found exceptions to this rule in cases where the results of optimizing a variable, which was known to be result effective, were unexpectedly good. (Citations omitted.) This case, in which the parameter optimized was not recognized to be a result-effective variable, is another exception.” 195 USPQ at 8-9.

Therefore, the guidance of *In re Antonie* requires that a variable must achieve a recognized result before the determination of the optimum or workable ranges of the variable might be characterized as routine experimentation. Secondly, where the results of optimizing a variable, which was known to be result effective, were unexpectedly good, a prima facie case of obviousness can be rebutted.

The Applicants have stated at page 7, lines 23-25 of the specification that in the described tests of hop acids, the “Sensitivity of *Staphylococcus aureus* appears to increase under acidic conditions”. It is not believed that this result is taught in the prior art of record. In other words, the pH parameter was not recognized in the prior art to be a result-effective variable.

First, the Office Action acknowledges that US '552 does not teach the tetrahydroiso-alpha acids and hexahydro-beta acids used in the claimed invention. Upon review of US '276, it does not appear that US '276 teaches the tetrahydroiso-alpha acids and hexahydro-beta acids used in the claimed invention. With respect to US '178, review of this document does not appear to reveal any teaching of the increased antibacterial activity of hop acids under acidic environments.

Thus, it is submitted that the acidic environment now recited in the claims was not recognized in the prior art of record to be a result-effective variable. Furthermore, the prior art of record does not teach or suggest the increased sensitivity of the hop acids in an acidic environment.

#### Conclusion

Thus, it is submitted that all of the features of amended independent claim 1 (and claims 2-3 that depend thereon) and amended independent claim 4 are not shown or suggested in US '552 and US '178 and US '276. Favorable reconsideration is respectfully requested.

A fee sheet is attached for the three month extension and the RCE fee. No additional fees are believed to be needed for this amendment. However, if additional fees are needed, please charge them to Deposit Account No. 17-0055.

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